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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/750,575	12/29/2003	Hyung Ki Hong	12581/4134	8928

7590 04/20/2007  
Brinks Hofer Gilson & Lione  
Post Office Box 10395  
Chicago, IL 60610

EXAMINER
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NGUYEN, THANH NHAN P

ART UNIT	PAPER NUMBER
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2871

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/750,575	<b>Applicant(s)</b> HONG, HYUNG KI	
	<b>Examiner</b> (Nancy) Thanh-Nhan P. Nguyen	<b>Art Unit</b> 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-10 and 12-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,7-9 and 14 is/are rejected.
- 7) ☒ Claim(s) 4,6,10,12 and 13 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

**Claims 1 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Umemoto et al (US 2003/0043315).**

Umemoto et al discloses (fig. 1 and par. 0037) a liquid crystal display (LCD) module comprising:

Claim 1:

- a light source (5) to generate light
- a light guide panel (10) through which the light from the light source propagates, the light guide panel having a first refractive index, [substrate (10) acting as light guide panel, see par. 0037, -- emphasis added]
- a low refractive index layer (14) disposed on the light guide panel, the low refractive index layer having a second refractive index which is lower than the first refractive index
- a transmissive LCD panel disposed on the upper portion of the low refractive index layer, wherein the transmissive liquid crystal display panel includes an upper substrate (20) facing the low refractive index layer with liquid crystal (30)

therebetween, and no substrate is disposed between the liquid crystal and the light guide panel

Claim 14:

- a reflective plate (6) disposed below the light guide panel

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 2, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umemoto et al in view of Yamamoto et al (US 5,341,231).**

**Regarding claim 7,** Umemoto et al lacks disclosure of a condenser disposed between the light source and the light guide panel.

Yamamoto discloses a condenser (fig. 6, ref. 62a, 62b) disposed between the light source and the light guide panel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a condenser disposed between the light source and the light guide panel in Umemoto et al since one would be motivated to limit the incident angle of the incident light from the light source lamps (col. 9, lines 21-22, 26-30, 52-53) so that the module is capable of presenting a bright display (col. 3, lines 50-52; col. 4, lines 10-58).

**Regarding claims 2 and 8**, Umemoto et al lacks disclosure of light in the light guide panel that is totally reflective at a border between the light guide panel and the low refractive index layer when the light in the light guide panel impinges on the border at an angle of  $90^\circ - \sin^{-1}(1/\text{first refractive index}) > \sin^{-1}(\text{the second refractive index}/\text{the first refractive index})$ .

Yamamoto discloses an LCD wherein the light in the light guide panel that is totally reflective at a border between the light guide panel and the low refractive index layer when the light in the light guide panel impinges on the border at an angle of  $90^\circ - \sin^{-1}(1/\text{first refractive index}) > \sin^{-1}(\text{the second refractive index}/\text{the first refractive index})$  (col. 5, line 26; col. 9, line 50; col. 10, line 63; col. 11, lines 55 – col. 12, line 20).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have light in the light guide panel that is totally reflective at a border between the light guide panel and the low refractive index layer when the light in the light guide panel impinges on the border at an angle of  $90^\circ - \sin^{-1}(1/\text{first refractive index}) > \sin^{-1}(\text{the second refractive index}/\text{the first refractive index})$  since one would be motivated to ultimately provide a display that is capable of presenting a bright display (col. 3, lines 50-52; col. 4, lines 10-58).

**Claims 3 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Umemoto et al in view of Gotoh et al (US 2002/0154256).**

**Regarding claims 3 and 9**, Umemoto et al lacks disclosure of the first refractive index is 1.7 or 1.5 and the second refractive index is 1.35.

Gotoh discloses an LCD lighting apparatus (title) having a low refractive index layer (fig. 13, ref. 89) with an index of 1.5, [par. 0151], and the light guide plate (73) having an index of 1.5, [par. 151].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have the first refractive index of 1.5 or 1.7 and the second refractive index of 1.35 since one would be motivated not only to facilitate total internal reflection by decreasing the critical angle values, but also optimize display contrast by reducing the reflection factor at the boundaries, [pars. 0152-0156].

***Allowable Subject Matter***

**Claims 4, 6, 10, 12 and 13** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Reason for allowance:

A liquid crystal display module comprising a relationship of various elements as claimed with the specific allowable subject matter cited in the following claims:

Claims 4, 6, 10 and 12:

- optical sheets disposed on the low refractive index layer
- a polarizer disposed on the optical sheets to polarize light from the optical sheets

Claim 13:

- the low refractive index layer disposed on a first surface of the light guide panel

Art Unit: 2871

- a second surface of the light guide panel that opposes the first surface has a plurality of grooves to reflect light impinging on the grooves towards the transmissive liquid crystal display panel

### ***Response to Arguments***

Applicant's arguments, filed 2/1/2007, with respect to the rejection(s) of claim(s) 1 under 35 U.S.C 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Umemoto et al (US 2003/0043315).

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P. Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/750,575

Page 7

Art Unit: 2871

(Nancy) Thanh-Nhan P Nguyen

Examiner

Art Unit 2871

TN



David Nelms

Supervisory Patent Examiner  
Technology Center 2800